AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A base station of a mobile communication system comprising:

a communication monitor circuit for detecting quality deterioration of radio communication with mobile stations, wherein:

said communication monitor circuit comprises:

a monitor unit for monitoring a communication state of said radio communication;

a judging unit coupled to said monitor unit for judging whether said communication state monitored by said monitor unit is worse than a predetermined state; and

a notifying unit coupled to said judging unit for notifying an external circuit of said quality deterioration when said judging unit judges that said communication state is worse than said predetermined state,

wherein the judging unit judges whether said communication state monitored by said monitor unit is worse than the predetermined state based on a quality of a group of individual communication between the mobile stations and the base station.

2. (previously presented): A base station as claimed in Claim 1, further comprising receivers for demodulating transmission signals transmitted from said mobile stations to produce demodulated signals, wherein:

said monitor unit is coupled to said receivers for monitoring total interference electric power of said demodulated signals as said communication state; and

said judging unit judges that said communication state is worse than said predetermined state when said total interference electric power is equal to or larger than a predetermined threshold.

3. (previously presented): A base station as claimed in Claim 1, further comprising:

receivers for demodulating transmission signals transmitted from said mobile stations to produce demodulated signals; and

signal-to-noise ratio determining circuits coupled to said receivers respectively for determining signal-to-noise ratios of said demodulated signals, wherein:

said monitor unit, coupled to said signal-to-noise ratio determining circuits, monitors said signal-to-noise ratios as said communication state; and

said judging unit judges that said communication state is worse than said predetermined state when the number of signal-to-noise ratios, each of which is smaller than a predetermined value, is equal to or larger than a predetermined threshold.

4. (previously presented): A base station as claimed in Claim 1, further comprising:

receivers for demodulating transmission signals transmitted from said mobile stations to produce demodulated signals;

signal-to-noise ratio determining circuits coupled to said receivers respectively for determining signal-to-noise ratios of said demodulated signals; and

transmission power control bit generators coupled to said signal-to-noise ratio determining circuits, respectively, for generating transmission power control bit signals based on said signal-to-noise rations, wherein:

said monitor unit, coupled to said transmission power control bit generators, monitors said transmission power control bit signals as said communication state; and

said judging unit judges that said communication state is worse than said predetermined state when the number of said transmission power control bit signals, each of which require an increase of transmission power, is equal to or larger than a predetermined threshold.

5. (previously presented): A base station as claimed in Claim 1, further comprising;

receivers for demodulating transmission signals transmitted from said mobile stations to produce demodulated signals, wherein:

said monitor unit, coupled to said receivers, monitors total interference electric power of said demodulated signals and the number of said mobile terminals communicating with said base station as said communication state; and

said judging unit judges that said communication state is worse than said predetermined state when a changing rate of a ratio of said total interference electric power to the number of

said mobile terminals communicating with said base station is equal to or larger than a predetermined threshold.

6. (currently amended): A base station of a mobile communication system comprising:

receivers for demodulating transmission signals transmitted from mobile stations to produce demodulated signals

signal-to-noise ratio determining circuits coupled to said receivers, respectively, for determining signal-to-noise ratios of said demodulated signals;

transmission power control bit generators coupled to said signal-to-noise ratio determining circuits, respectively, for generating said transmission power control bit signals based on said signal-to-noise ratios;

a communication state monitor circuit coupled to said receivers for detecting quality deterioration of a communication state of radio communication between said base station and said mobile stations; and

a transmission power bit adjusting circuit coupled to said communication state monitor circuit and said transmission power control bit generators for controlling said transmission power control bit signals so as to suppress an increase of transmission power of said mobile stations when said communication state monitor circuit detects said quality deterioration,

wherein the communication state monitor detects the quality deterioration based on a quality of a group of individual communication between the mobile stations and the base station.

7. (previously presented): A base station as claimed in Claim 6, wherein said transmission power control bit generators generate the transmission power control bit signals which requires an increase of transmission power of said mobile stations when signal-to-noise ratios are equal to or lower than a desired value; and

said transmission power control bit adjusting circuit decreases said desired value to suppress an increase of transmission power of said mobile stations when said communication state monitor circuit detects said quality deterioration.

8. (previously presented): A base station as claimed in Claim 6, wherein:

said transmission power control bit adjusting circuit changes said transmission power control bit signals so that said transmission power control bit signals require a decrease of said transmission power of said mobile stations.

9. (previously presented): A base station as claimed in Claim 6, wherein said communication state monitor circuit comprises:

a monitor unit for monitoring said communication state of said radio communication;

a judging unit coupled to said monitor unit for judging whether said communication state monitored by said monitor unit is worse than a predetermined state; and

a notifying unit coupled to said judging unit for notifying said transmission power control bit adjusting unit of said quality deterioration when said judging unit judges that said communication state is worse than said predetermined state.

10. (previously presented): A base station as claimed in Claim 6, wherein:

said communication state monitor circuit, is connected to said receivers, monitors total interference electric power of said demodulated signals as said communication state and judges that said communication state is worse than said predetermined state when said total interference electric power is larger than a predetermined threshold.

11. (previously presented): A base station as claimed in Claim 6, wherein:

said communication state monitor circuit, coupled to said signal-to-noise ratio determining circuits, monitors said signal-to-noise ratios as said communication state and judges that said communication state is worse than said predetermined state when the number of signal-to-noise ratios, each of which is smaller than a predetermined value, is equal to or larger than a predetermined threshold.

12. (previously presented): A base station as claimed in Claim 6, wherein:

said communication state monitor circuit, coupled to said transmission power control bit generators, monitors said transmission power control bit signals as said communication state and judges that said communication state is worse than said predetermine state when the number of said transmission power control bit signals, each of which require an increase of transmission power, is equal to or larger than a predetermined threshold.

13. (previously presented): A base station as claimed in Claim 6, wherein:

said communication state monitor circuit, coupled to said receivers, monitors total interference electric power of said demodulated signals and the number of said mobile terminals communicating with said base station as said communication state and judges that said communication state is worse than said predetermined state when a changing rate of a ratio of said total interference electric power to the number of said mobile terminals communicating with said base station is equal to larger than a predetermined threshold.

14. (currently amended): A transmission power control system for use in a base station of a mobile communication system, said base station including receivers for demodulating transmission signals transmitted from said mobile stations to produce demodulated signals, signal-to-noise ratio determining circuits coupled to said receivers, respectively, for determining signal-to-noise ratios of said demodulated signals and transmission power control bit generators connected to said signal-to-noise ratio determining circuits respectively for generating said transmission power control bit signals based on said signal-to-noise rations, said transmission power control system comprising:

a communication state monitor circuit coupled to said receivers for detecting quality deterioration of a communication state of radio communication between said base station and said mobile stations; and

a transmission power bit adjusting circuit coupled to said communication state monitor circuit and said transmission power control bit generators for controlling said transmission power

control bit signals so as to suppress an increase of transmission power of said mobile stations when said communication state monitor circuit detects said quality deterioration,

wherein the communication state monitor detects the quality deterioration based on a quality of a group of individual communication between the mobile stations and the base station.

15. (previously presented): A transmission power control system as claimed in Claim 14, wherein:

said transmission power control bit generators generate said transmission power control bit signals which require an increase of transmission power of said mobile stations when said signal-to-noise ratios are equal to or lower than a desired value; and

said transmission power control bit adjusting circuit decreases said desired value to suppress an increase of transmission power of said mobile stations when said communication state monitor circuit detects said quality deterioration.

16. (previously presented): A transmission power control system as claimed in Claim 14, wherein said transmission power control bit adjusting circuit changes said transmission power control bit signals so that said transmission power control bit signals require a decrease of said transmission power of said mobile stations.

17. (previously presented): A transmission power control system as claimed in Claim 14, wherein said communication state monitor circuit comprises:

a monitor unit for monitoring said communication state of said radio communication;

a judging unit coupled to said monitor unit for judging whether said communication state monitored by said monitor unit is worse than a predetermined state; and

a notifying unit coupled to said judging unit for notifying said transmission power control bit adjusting unit of said quality deterioration when said judging unit judges that said communication state is worse than said predetermined state.

18. (previously presented): A transmission power control system as claimed in Claim 17, wherein:

said monitor unit, coupled to said receivers, monitors total interference electric power of said demodulated signals as said communication state; and

said judging unit judges that said communication state is worse than said predetermined state when said total interference electric power is equal to or larger than a predetermined threshold.

19. (previously presented): A transmission power control system as claimed in Claim 17, wherein:

said monitor, coupled to said signal-to-noise ratio determining circuits, monitors said signal-to-noise ratios as said communication state; and

said judging unit judges that said communication state is worse than said predetermined state when the number of signal-to-noise ratios, each of which is smaller than a predetermined value, is equal to or larger than a predetermined threshold.

20. (previously presented): A transmission power control system as claimed in Claim 17, wherein:

said monitor unit, coupled to said transmission power control bit generators, monitors said transmission power control bit signals as said communication state; and

said judging unit judges that said communication state is worse than said predetermine state when the number of said transmission power control bit signals, each of which require an increase of transmission power, is equal to or larger than a predetermined threshold.

21. (previously presented): A transmission power control system as claimed in Claim 17, wherein:

said monitor unit, coupled to said receivers, monitors total interference electric power of said demodulated signals and the number of said mobile terminals communicating with said base station as said communication state; and

said judging unit judges that said communication state is worse than said predetermined state when a changing rate of a ratio of said total interference electric power to the number of said mobile terminals communicating with said base station is equal to larger than a predetermined threshold.

22. (currently amended): A method of controlling transmission power of mobile stations from a base station of a mobile communication system, comprising:

monitoring, at said base station, a communication state of radio communication between said base station and said mobile stations;

judging, at said base station, whether said monitored communication state is worse than a predetermined state; and

notifying, in said base station, an external circuit of said quality deterioration when said communication state is judged to be worse than said predetermined state,

wherein the judging whether the monitored communication state is worse than the predetermined state is based on a quality of a group of individual communication between the mobile stations and the base station.

23. (previously presented): A method as claimed in Claim 22, comprising demodulating transmission signals transmitted from said mobile stations to produce demodulated signals, wherein:

total interference electric power of said demodulated signals is monitored as said communication state; and

said communication state is judged to be worse than said predetermined state when said total interference electric power is equal to or larger than a predetermined threshold.

24. (previously presented): A method as claimed in Claim 22, comprising demodulating transmission signals transmitted from said mobile stations to produce demodulated signals and determining signal-to-noise ratios of said demodulated signals, wherein:

said monitoring periodically monitors an average of said signal-to-noise ratios as said communication state; and

said communication state is judged to be worse than said predetermined state when the number of signal-to-noise ratios, each of which is smaller than a predetermined value, is equal to larger than a predetermined threshold.

25. (previously presented): A method as claimed in Claim 22, comprising demodulating transmission signals transmitted from said mobile stations to produce demodulated signals, determining signal-to-noise ratios of said demodulated signals and generating transmission power control bit signals on the basis of said signal-to-noise rations, wherein:

said transmission power control bit signals are monitored as said communication state; and

said communication state is judged to be worse than said predetermine state when the number of said transmission power control bit signals, each of which require increase of transmission power, is equal to or larger than a predetermined threshold.

26. (previously presented): A method as claimed in Claim 22, comprising demodulating transmission signals transmitted from said mobile stations to produce demodulated signals, wherein:

total interference electric power of said demodulated signals and the number of said mobile terminals communicating with said base station are monitored as said communication state; and

said communication state is judged to be worse than said predetermined state when a changing rate of a ratio of said total interference electric power to the number of said mobile terminals communicating with said base station is equal to or larger than a predetermined threshold.

27. (currently amended): A method of controlling transmission power of mobile stations of a mobile communication system by use of transmission power control bit signals transmitted from a base station, comprising:

demodulating transmission signals transmitted from said mobile stations to produce demodulated signals;

determining signal-to-noise ratios of said demodulated signals;

generating said transmission power control bit signals on the basis of said signal-to-noise rations;

detecting, at said base station, quality deterioration of a communication state of radio communication between said base station and said mobile stations; and

controlling, at said base station, said transmission power control bit signals so as to suppress an increase of transmission power of said mobile stations when said quality deterioration is detected,

wherein the detecting the quality deterioration of a communication state is based on a quality of a group of individual communication between the mobile stations and the base station.

28. (previously presented): A method as claimed in Claim 27, wherein said transmission power control bit signals, which require an increase of transmission power of said mobile stations, are generated when said signal-to-noise ratios are lower than a desired value, and

said desired value is decreased to suppress an increase of transmission power of said mobile stations when said quality deterioration is detected.

29. (previously presented): A method as claimed in Claim 27, wherein:

said transmission power control bit signals are changed so that said transmission power control bit signals require a decrease of said transmission power of said mobile stations.

30. (previously presented): A method as claimed in Claim 27, wherein detecting comprises:

monitoring said communication state of said radio communication;

judging whether said monitored communication state is worse than a predetermined state; and

notifying said quality deterioration when said communication state is judged to be worse than said predetermined state.

31. (previously presented): A method as claimed in Claim 27, wherein:

total interference electric power of said demodulated signals is monitored as said communication state; and

said communication state is judged to be worse than said predetermined state when said total interference electric power is equal to or larger than a predetermined threshold.

32. (previously presented): A method as claimed in Claim 27, wherein:

said monitoring monitors each of said signal-to-noise ratios as said communication state; and

said communication state is judged to be worse than said predetermined state when the number of signal-to-noise ratios, each of which is smaller than a predetermined value, is equal to or larger than a predetermined threshold.

33. (previously presented): A method as claimed in Claim 27, wherein:

said transmission power control bit signals are monitored as said communication state; and

said communication state is judged to be worse than said predetermined state when the number of said transmission power control bit signals, each of which require an increase of transmission power, is equal to larger than a predetermined threshold.

34. (previously presented): A method as claimed in Claim 27, wherein:

total interference electric power of said demodulated signals and the number of said mobile terminals communicating with said base station are monitored as said communication state; and

said communication state is judged to be worse than said predetermined state when a changing rate of a ratio of said total interference electric power to the number of said mobile terminals communicating with said base station is equal to or larger than a predetermined threshold.

35. (currently amended): A base station in a mobile communication system comprising:

a receiver which demodulates transmission signals transmitted from plural mobile stations;

a communication state monitor, coupled to said receiver, which detects a deterioration of a communication state of radio communication between said base station and the plural mobile stations;

a transmission power control signal adjusting circuit, coupled to said communication state monitor, which controls transmission power control signals so as to decrease the

transmission power of the plural mobile stations if said communication ~~sate~~ state monitor detects the deterioration; and

a transmitter, coupled to said transmission power control signal adjusting circuit, which transmits the transmission power control signals to the plural mobile stations,

wherein the communication state monitor detects the deterioration of the communication state based on a quality of a group of individual communication between the mobile stations and the base station.

36. (currently amended): A base station according to claim 35, wherein, said communication ~~sate~~ state monitor monitors an interference power of the transmission signals received by said receiver, and detects the deterioration of the communication ~~sate~~ state based on the interference power.

37. (currently amended): A mobile station among plural mobile stations, in a mobile communication system, comprising:

a transmitter which transmits a signal to a base station;

a receiver which receives, from the base station, a transmission power control signal directing to decrease a power of the signal to be transmitted to the base station in the case where a deterioration of a communication ~~sate~~ state of radio communication between the base station and the plural mobile stations is detected at the base station; and

a transmission power controller which decides a transmission power of the signal to be transmitted to the base station based on the transmission power control signal,

wherein deterioration of the communication state is detected based on a quality of a group of individual communication between the mobile stations and the base station.

38. (currently amended): A mobile station according to claim 37, wherein, the deterioration of the communication ~~sate~~ state is detected based on an interference power of transmission signals, from the plural mobile stations, received by the base station.

39. (currently amended): A mobile communication system comprising a base station and plural mobile stations, wherein said base station comprises:

a receiver which demodulates transmission signals transmitted from said plural mobile stations;

a communication state monitor, coupled to said receiver, which detects a deterioration of a communication state of radio communication between said base station and said plural mobile stations;

a transmission power control signal adjusting circuit, coupled to said communication state monitor, which controls transmission power control signals so as to decrease the transmission power of said plural mobile stations if said communication ~~sate~~ state monitor detects the deterioration; and

a transmitter, coupled to said transmission power control signal adjusting circuit, which transmits the transmission power control signals to the plural mobile stations, and

each of said mobile stations comprises:

a transmitter which transmits a signal to said base station;

a receiver which receives one of the transmission power control signals from the base station; and

a transmission power controller which decides a transmission power of the signal to be transmitted to said base station based on the transmission power control signal received by said receiver,

wherein the communication state monitor detects the quality deterioration of the communication state based on a quality of a group of individual communication between the mobile stations and the base station.

40. (currently amended): A method, for a mobile communication system comprising a base station and plural mobile stations, comprising:

demodulating transmission signals transmitted from the plural mobile stations;

detecting, at the base station, a deterioration of a communication state of radio communication between said base station and the plural mobile stations;

controlling, at the base station, power control signals so as to decrease the transmission power of the plural mobile stations if ~~said~~ a communication ~~sate~~ state monitor detects the deterioration; and

transmitting the transmission power control signals to the plural mobile stations,

wherein the detecting the deterioration of the communication state is based on a quality of a group of individual communication between the mobile stations and the base station.

41. (currently amended): A method, for a mobile communication system comprising a base station and plural mobile stations, comprising:

transmitting a signal to the base station;

receiving, from the base station, a transmission power control signal directing to decrease a power of the signal to be transmitted to the base station in the case where a deterioration of a communication ~~sate~~ state of radio communication between the base station and the plural mobile stations is detected at the base station; and

deciding a transmission power of the signal to be transmitted to the base station based on the transmission power control signal,

wherein deterioration of the communication state is detected based on a quality of a group of individual communication between the mobile stations and the base station.

42. (currently amended): A method for a mobile communication system, comprising a base station and plural mobile stations, comprising:

demodulating transmission signals transmitted from the plural mobile stations;

detecting, at the base station, a deterioration of a communication state of radio communication between said base station and the plural mobile stations;

controlling, at the base station, transmission power control signals so as to decrease the transmission power of the plural mobile stations if said communication ~~sate~~ state monitor detects the deterioration;

transmitting the transmission power control signals to the plural mobile stations;

transmitting a signal to the base station;

receiving one of the transmission power control signals form the base station; and deciding a transmission power of the signal to be transmitted to the base station based on the transmission power control signal received,

wherein the detecting the deterioration of the communication state is based on a quality of a group of individual communication between the mobile stations and the base station.